

## PATENT ABSTRACTS OF JAPAN

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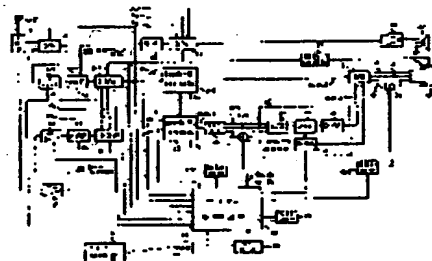
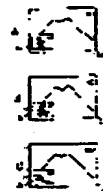
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## (54) TELEVISION RECEIVER

## (57)Abstract:

PURPOSE: To prevent the confusion of an user by reproducing a secondary channel picture when a secondary channel selecting means is operated while an external input picture is reproduced in a secondary screen to save a video signal source changeover means for a secondary picture.

CONSTITUTION: When an up-and-down key of a secondary channel number of a remote controller 24 is pressed, whether the secondary picture is a TV mode or not is decided in a system control circuit 20. When the secondary picture is a video mode, an operation mode of the secondary picture is once changed over to the TV mode according to a channel selecting operation. At the time of the changeover to the TV mode, a last memory functions and the secondary picture is initially set to the secondary channel of the final TV mode and the picture of the channel #21 is reproduced on the secondary screen Ss and the number of the secondary channel is displayed.



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**CLAIMS**

(57) [Claim(s)]

[Claim 1] While displaying on the main screen any of the main channel signal or an external input signal they are through the means for switching as which the main-sub channel signal and external input signal from a main-sub tuner are inputted, and said means for switching A display means to display on a sub-screen any of the subchannel signal outputted through said means for switching, or an external input signal they are, A storage means to memorize the last channel of said subtuner at least, The actuation means for directing a rise or down of the channel of said subtuner, It is in the 1st condition that the image of said external input signal is displayed on said sub-screen. And when a rise or down of a subchannel is directed by said actuation means, while controlling said means for switching that it should consider as the 2nd condition that the subimage of the subchannel signal from said subtuner is displayed on said sub-screen The television receiver characterized by providing a system control means to control said subtuner that the subimage of a last channel with which said subtuner was memorized by said storage means should be received.

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**DETAILED DESCRIPTION**

[Detailed Description of the Invention]

This invention is explained in order of the following.

A Field of the Invention B Outline C of invention Prior-art D Trouble E which invention tends to solve Means for solving a trouble ( Fig. 1 )

F Operation G Example G1 The whole configuration ( Fig. 3 )

G2 Playback of the Lord and a subimage ( Fig. 4 , Fig. 5 )

G3 Channel selection of a subchannel ( Fig. 1 , Fig. 2 )

H Effect-of-the-invention A Field of the Invention This invention relates to the television receiver it was made to display a sub-screen in the main screen.

B Outline of invention In the television receiver of the sub-screen display form in the main screen, when a subchannel channel selection means is operated at the time of playback of the external input image within a sub-screen, by making as [ reproduce / a subchannel image ], this invention omits the source means for switching of a video signal for subimages, and prevents a user's derangement.

C Prior art The so-called television receiver (it is called a P/P receiving set for short below) of the picture Inn picture form where it was made to display a sub-screen in the main screen is known conventionally.

The P/P receiving set equips the sub-screen with the memory for reproducing an image, and can reproduce an animation to a sub-screen by repeating the writing of this memory, and read-out by turns continuously so that it may mention later.

And by the conventional P/P receiving set, a high frequency signal like broadcast or CATV and the external video signal of baseband like VTR or a videodisk were made into the object as each source of a signal of the image (subimage) reproduced by the image (the main image) reproduced by the main screen and the sub-screen.

D Trouble which invention tends to solve As for television broadcasting, in time, two

programs through which the viewer is leaking interest may be broadcast by coincidence like [ as the program of the baseball of \*\*\*\*\*, and the program of the golf of other broadcasting stations ].

In such a case, by the conventional P/P receiving set, the regenerative function of the Lord and two screens of \*\* could not be utilized, but the P/P receiving set in which two RF reception is possible was demanded.

However, as a channel selection actuation device, when two tuners were formed, when the rise of the key (ten key) of the figures from zero to nine and a channel number and the key of a down were prepared for every tuner, there was a problem of there having been too many keys and causing the unnecessary derangement by a user's operation mistake etc.

In addition, in the receiving set or the remote controller, since the area of the actuation key for various kinds of control which can be attached was restricted, increasing the number of actuation keys had the problem of being difficult.

Moreover, by the P/P receiving set, although a change-over with a television broadcasting receive state (TV mode) and an external video-signal playback condition (video mode) is required, if this mode change-over and the channel selection of a tuner are related, since circuitry will become complicated, a mode change-over and a channel selection are performed by carrying out mutually-independent.

However, if a mode exchange key and a channel selection actuation device are established to two tuners, respectively, the number of keys will increase further and an above-mentioned trouble will be promoted.

In view of \*\*\*\*\*, a control unit is simplified and the purpose of this invention is in the place which offers the television receiver of the sub-screen display mold in the main screen which does not cause a user's derangement.

E Means for solving a trouble The means for switching as which, as for this invention, the main-sub channel signal and external input signal from a main-sub tuner (5M) (5S) are inputted (7M) (7S), While displaying any of the main channel signal outputted through this means for switching (7M) (7S), or an external input signal they are on the main screen Sm A display means to display any of the subchannel signal outputted through a means for switching (7M) (7S), or an external input signal they are on Sub-screen Ss (18), A storage means to memorize the last channel of a subtuner at least (21), The actuation means (22) for directing a rise or down of the channel of a subtuner, and (24), When it is in the 1st condition that the image of an external input signal is displayed on a sub-screen and a rise or down of a subchannel is directed by said actuation means (22) and (24) While controlling a means for switching (7M) (7S) that it should consider as the 2nd condition that the subimage of the subchannel signal from subCHANA (5S) is displayed on a sub-screen A subtuner (5S) is the television receiver characterized by providing a system control means (20) to control a subtuner (5S) that the subimage of the last channel memorized by the storage means (21) should be received.

F Operation According to \*\*\*\*\* this invention, especially the control operation means for switching the mode of operation of a subimage is not established, but \*\* is also ensured without derangement the mode-of-operation change of a subimage.

G Example One example of the television receiver by this invention is explained hereafter, referring to Figs. 1 - 5 .

G1 The whole configuration With reference to Fig. 3 , the configuration of the whole television receiver of one example is explained first. This television receiver has the main television circuit MK and the subtelevision circuit SK, projects the main screen to the whole tubular surface of a cathode-ray tube (18) based on the video signal from the main television circuit MK, and based on the video signal from the subtelevision circuit SK, it projects it to a tubular surface so that a sub-screen may be inserted in some main screens. These television circuits MK and SK are equipped with a tuner (5M), (5S), an image intermediate frequency circuit (6M) and (6S) an image and a chrominance-signal circuit (8M), and (8S), respectively. Moreover, it has the external video-signal input terminals V1, V2, and V3 with which the playback video signal (baseband signaling) from VTR etc. is supplied, and is made as [ project / it is switched by the switching circuit (7M) where the external video signal from

these input terminals was formed in the television circuits MK and SK, respectively, and (7S) with a tuner (5M) and the video signal from (5S), and a cathode-ray tube (18) is supplied, and / S / the image ].

The video-signal processing circuit (12) for projecting a sub-screen to a cathode-ray tube (18) is established in the subtelevision circuit SK, and he is trying for this to control the location on the number of a sub-screen, and the main screen of a sub-screen etc. exceptions, such as an animation of a sub-screen, a still picture, and \*\*\*\*\*.

A character representation circuit (19M) and (19S) are prepared in the television circuits MK and SK, respectively, and it is made as [ project / the image discernment display of the number of the receiving channel of television broadcasting, and an external video-signal input terminal etc. / to the main screen and a sub-screen / at each \*\* / superimpose and ].

A system control circuit (20) equipped with a microcomputer is prepared, and it is made as [ control / by this / each part of a television receiver ].

Below, the configuration of this television receiver is further explained to a detail. The input signal from Antenna AT is supplied to a turnout (1). This turnout (1) is supplied to the main tuner (5M) through a switching circuit (3), without decreasing most input signals, and branches and supplies that part to a subtuner (5S). The input signal to this subtuner (5S) is amplified by the high-frequency amplifier (4). A switching circuit (3) switches the antenna input from a turnout (1), and the high frequency input from the descrambler for cable television broadcasting reception from an auxiliary input terminal (2) etc., and supplies them to the main tuner (5M).

The image intermediate frequency signal from the main tuner (5M) is supplied to the main image intermediate frequency circuit (6M), the video signal from this is supplied to a main-switch circuit (7M), it is switched with the external video signal from the external video-signal input terminals V1-V3, and one of video signals [ them ] is supplied to the main image and a chrominance-signal circuit (8M). In addition, (26) is a monitor output terminal and is connected to the output side of a main-switch circuit (7M). From this main image and chrominance-signal circuit (8M), red, and green and the blue signals R, G, and B are outputted, and a switching circuit (9) is supplied.

The voice intermediate frequency signal from the main image intermediate frequency circuit (6M) is supplied to a voice circuit (the voice multiplex circuit is built in) (28). The sound signal from the voice circuit (28) is supplied to a switching circuit (29). It is switched with the external sound signal corresponding to the above-mentioned external video-signal input terminals V1-V3 reproduced from VTR from the external sound signal input terminals A1 and A2 and A3 etc., and one of sound signals [ them ] is supplied to a loudspeaker (31) through low-frequency amplifier (30).

Level \*\*\*\*\* from the main image and a chrominance-signal circuit (8M) is supplied to a deviation and a high-tension circuit (27), and the deviation signal and high voltage direct current electrical potential difference from this are supplied to a cathode-ray tube (18).

The image intermediate frequency signal from a subtuner (5S) is supplied to a subimage intermediate frequency circuit (6S). The video signal from this is supplied to a subswitching circuit (7S), and is switched with the external video signal from the external video-signal input terminals V1-V3. After 1 of video signals [ them ] and the video signal from a main-switch circuit (7M) are switched by the switch (25), a subimage and a chrominance-signal circuit (8S) are supplied. From this subimage and chrominance-signal circuit (8S), green and the blue signals R, G, and B are acquired, and red and after these are supplied to a matrix circuit (10) and changed into brightness, a red difference and the blue difference signal Y, R-Y, and B-Y, the A/D converter (13) of a video-signal processing circuit (12) is supplied.

This A/D converter (13) is a \*\*\*\* time-sharing form A/D converter currently indicated by JP,60-44792,B. The digital signal from an A/D converter (13) is supplied and written in memory (14). The digital signal read from memory (14) is supplied to a D/A converter (15), and is changed into an analog signal. It is made to thin out Rhine of a video signal, and a pixel in a video-signal processing circuit (12) according to the proportion of the main screen and a sub-screen. Memory (14) has four frame (or field) memory areas according to the

possible maximum number of a sub-screen, 4 [ for example, ]. As for this memory (14), the location on the number of a sub-screen and the main screen of a sub-screen etc. is controlled by the sub-screen control circuit (16) exceptions, such as an animation of a sub-screen, a still picture, and \*\*\*\*\*.

When using a sub-screen as an animation, writing and read-out of the video signal of memory (14) are repeated by turns continuously. This is repeated and read after writing a video signal in memory (14) per a frame or field, when using a sub-screen as a still picture. At the time of \*\*\*\*\* of a sub-screen, this is repeated and read, after writing in two or more video signals to timing which is different in memory (14) per a frame or field (refer to JP, 56-27573, A). The number of the sub-screen inserted in in the main screen is determined with the use number of the memory area in memory (14), respectively. As contents of the sub-screen, it is the animation of the video signal from a subimage and a chrominance-signal circuit (8S), a still picture, \*\*\*\*\* or the still picture of the video signal from the main image and a chrominance-signal circuit (8M), and \*\*\*\*\* , and a switch of the switch (25) mentioned above performs a switch of these video signals. The contents of an image of the main screen and a sub-screen can be replaced by a coincidence switch of the Lord and a subtuner (5M), and the receiving channel of (5S) or the Lord and the subswitching circuit (7M), and coincidence switch of (7S).

Each chrominance signal from the main image and a chrominance-signal circuit (8M) and each chrominance signal from the D/A converter (15) of a video-signal processing circuit (12) are supplied to a switching circuit (9), and both \*\*\*\*\* are switched so that a sub-screen may be inserted in the predetermined location where some main screens were chosen. This switching circuit (9) is controlled by the sub-screen control circuit (16). The video signal from a switching circuit (9) is supplied to a cathode-ray tube (18).

The main image discernment status signal made from the main sentence character display circuit (19M) is added to a video signal by the adder (17) formed between the switching circuit (9) and the cathode-ray tube (18). He inserts an adder (17) only in the transmission line of a green signal, and is trying to superimpose a green image discernment display on the main screen here. Other colors are sufficient as this image discernment display.

The subimage discernment status signal made in the subcharacter representation circuit (19S) is added to a subvideo signal by the adder (11) formed between the matrix circuit (10) and the A/D converter (13). He inserts an adder (11) only in the transmission line of a luminance signal, and is trying to superimpose a white image discernment display on a sub-screen here. Other colors are sufficient as this image discernment display.

The above-mentioned Lord and a subtuner (5M), and (5S) are tuned in by the channel select signal from a system control circuit (20). A switching circuit (3), (7M), (7S), (29), and a switch (25) are switched and controlled by the system control circuit (20). As for the Lord and a subimage and a chrominance-signal circuit (8M), and (8S), a blanking is applied by the system control circuit (20) at the time of the scan channel selection of amplifier and a down etc. In addition, this blanking may form the switch for blankings in the preceding paragraph of a cathode-ray tube (18), and may perform it in it. Moreover, the Lord and a subimage and a chrominance-signal circuit (8M), the Lord from (8S), and the subperpendicular blanking signals (perpendicular signal) Vm and Vs are supplied to a system control circuit (20) at the Lord and a subimage intermediate frequency circuit (6M), the Lord from (6S) and subHorizontal Synchronizing signal Hm, and Hs list. A sub-screen control circuit (16) is controlled by the system control circuit (20) by the Lord and a subcharacter representation circuit (19M), and the list (19S).

(21) is last condition memory, the Lord at the time of power-source cutoff and a subtuner (5M), the channel selection channel of (5S), a switching circuit (7M), the switch condition of (7S), the control state of a sub-screen control circuit (16), etc. are memorized by control of a system control circuit (20), and the condition of each part at the time of the power-source cutoff is reproduced by control of a system control circuit (20) at the time of a power-source reclosing.

(22) is key equipment, and it connected with the system control circuit (20), and it is equipped with the various keys for control of a television receiver.

(24) is a remote controller for controlling a television receiver, is equipped with various keys and has the transmitter which transmits the remote control signal based on actuation of the key. (23) is the receiver which receives the input signal from the transmitter of this remote controller (24), and is connected to the system control circuit (20). This remote control signal is conveyed by light, the electric wave, an acoustic wave, etc.

Next, the examples of the key of this remote controller (24) are enumerated. The ten key for selection of the number of a power key, a recall key (an image discernment display is projected), a mute key (silent [ audio ]), a receiving channel, and an external video-signal input terminal, television / VTR switch key, antenna input / auxiliary RF input switch key, a voice multiplex key. The number of a picture, the main receiving channel, and the main external video-signals input terminal and sound volume are each the key of a rise and a down. The on-off key of a sub-screen, a subreceiving channel and the rise key of the number of a subexternal video-signal input terminal, this down key, a still picture key, a \*\*\*\*\* key, the impaction efficiency key of a sub-screen, the Lord, and the exchange key of the contents of an image of a sub-screen.

In addition, in this example, the ten key for subchannel selection, and television / VTR switch key of a subimage are not prepared for the above reasons.

G2 Playback of the Lord and a subimage Next, playback of the Lord and the subimage of one example of this invention is explained, also referring to Figs. 4 and 5.

The main image is reproduced first.

The mode exchange key of an above-mentioned remote controller (24) is made into TV mode. As either the rise of the channel selection actuation key of the main tuner (5M), i.e., a ten key, and the main channel number and a down key are pressed and it is shown in Fig. 4 A If channel selection actuation is performed (step \*\*), it will be controlled by the system control circuit (20), for example, channel #21 will be selected as a main channel (step \*\*), and this channel number and channel selection data will be memorized by last memory (21) (step \*\*). And a channel number is displayed while the image of channel #21 is reproduced by the main screen Sm, as shown in Fig. 5 A.

If a mode exchange key is switched to a video mode and video #1 is chosen as main external video signals, this main external video-signals number will also be memorized by last memory (21) independently of the main channel number. And as shown in Fig. 5 B, while the image of video #1 is reproduced by the main screen Sm, the number of this external video signal is displayed.

Next, a subimage is reproduced.

If the sub-screen turning-on-and-off key (illustration is omitted) of a remote controller (24) is pressed as the 1st step as shown in Fig. 4 B (step \*\*), it will be judged whether the sub-screen is displayed in the system control machine (20) (step \*\*). When not displayed, a sub-screen is newly displayed, a subimage is reproduced (step \*\*), and when displayed, the sub-screen (and subimage) is eliminated (step \*\*). Thus, if a sub-screen turning-on-and-off key is pressed, the display condition of a sub-screen will be reversed for every press of a key, and the last display condition will be memorized by last memory (21) (step \*\*).

Next, when reproducing the image from a subtuner (5S) to this sub-screen, a rise and down key of the subchannel number of a remote controller (24) are pressed, and channel selection actuation as shown in above-mentioned Fig. 4 A is performed, for example, channel #14 are selected as a subchannel. This channel number etc. is memorized by last memory (21) like the case of the main channel.

Furthermore, selection by the user is possible for the display position of a sub-screen. If the sub-screen impaction efficiency key of a remote controller (24) is operated as shown in Fig. 4 C (step \*\*), corresponding to this actuation, a lower left corner will be selected from among four corners of the main screen (step \*\*), and this location will be memorized by last memory (21).

In this way, as shown in Fig. 5 C, while the image of channel #14 is reproduced by Sub-screen Ss as a subimage, a channel number is displayed on the lower left corner of the main screen Sm.

Moreover, in this example, exchange of the Lord and a subimage is possible. If the exchange

key of the Lord and the subimage of a remote controller (24) is pressed as shown in Fig. 4 D (step \*\*) While each channel selection data of the main tuner (5M) and the subtuner (5S) which were controlled by the system control circuit (20) and were memorized by last memory (21) etc. is replaced Mode-of-operation data are replaced and exchange of the channel of the Lord and a subimage and exchange in the mode of the Lord and a subimage are performed (step \*\*, \*\*). In the above-mentioned case, the main channel and the subchannel were selected by channel #21 and #14, respectively, and the main image was a video mode and the subimage was in TV mode. While channel #21 become a subchannel while channel #14 become the main channel, and the main image becomes TV mode by this exchange, a subimage serves as a video mode. Consequently, as shown in Fig. 5 D, the relation between the main image and a subimage becomes completely contrary to this drawing C.

In addition, the above channel numbers or external video-signal numbers are displayed on a screen during each time of actuation of various keys, for example, several seconds.

G3 Channel selection of a subchannel Next, while Figs. 1 and 2 refer to, the channel selection of the subchannel of one example of this invention is explained.

Fig. 1 is a flow chart of channel selection actuation of the subchannel of this example. If a rise and down key of the subchannel number of a remote controller (24) are pressed as shown in this Fig. 1 (step \*\*), in a system control circuit (20), it will be judged whether a subimage is in TV mode (step \*\*).

As shown in Fig. 2 A, when a subimage is a video mode, according to the rise of a subchannel number, and actuation of a down key, the mode of operation of a subimage is once switched to TV mode as well as the above-mentioned condition as the receiving set showed in Fig. 5 D (step \*\*). In this example, at the time of a change-over in this TV mode, last memory functions and a subimage is set as the subchannel in the last TV mode (step \*\*, \*\*).

As mentioned above, since the number of the subchannel of the Lord and subimage exchange was #21, as shown in Fig. 2 B, while the image of channel #21 is reproduced by the subbearing surface Ss, the number of a subchannel is displayed. When a subimage is in TV mode, channel selection actuation is started immediately and a desired subchannel is chosen by the rise of the subchannel number of a remote controller (24), and actuation of a down key (step \*\*). For example, if the rise key of a subchannel number is operated in the state of Fig. 2 B, #22 of a channel number will be selected as a subchannel. And a channel number is displayed while the image of #22 of a channel number is reproduced by Sub-screen Ss, as shown in Fig. 2 C.

The updating storage of the mode of operation of the subimage updated according to channel selection actuation as mentioned above, the channel selection data of a subchannel, etc. is carried out at last memory (step \*\*).

In addition, in this example, at the time of modification of only the above subimages, it is [ that the mode of operation of a subimage and a channel number are only displayed, and ], and the channel number of the main image etc. is not displayed.

As mentioned above, in this example, when a subimage is a video mode, it is switched to TV mode by the channel selection key stroke of a subchannel. Thereby, the mode-of-operation exchange key of a subimage can be omitted, and the unnecessary derangement by a user's failure etc. is prevented.

Moreover, in this example, as shown in Fig. 2 A, the operating state of each part which the power source was once intercepted [ the main image ] for TV mode and a subimage in the state of the video mode, the microcomputer in a system control circuit (20) was reset when only the receiving set carried out the reclosing of the power source later on, for example, was memorized by last memory (21) as mentioned above after the time to wait for 0.3 seconds is reproduced. Since there is no input from the source of an external video signal at this time, even if the subperpendicular signal Vs from a subimage and a chrominance-signal circuit (8S) removes, a sub-screen is confused and the subimage discernment status signal from a subcharacter representation circuit (19S) is outputted, the alphabetic character displayed by this cannot be read and comprehended. Even in such a case, if a rise and down key of the subchannel of a remote controller (24) are operated, as shown in Fig. 2 B, the image of the subchannel at the time of the last TV mode of a subimage will be reproduced, and a user's



derangement will be prevented.

H Effect of the invention Above, like a detailed explanation, since the video mode of a subimage was switched to TV mode by the rise for the channel selection of a subchannel, and actuation of a down key according to this invention, the control operation key for the mode-of-operation change of a subimage can be omitted, and the television receiver of the sub-screen display form in the main screen which does not cause a user's derangement is obtained.

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## DESCRIPTION OF DRAWINGS

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### [Brief Description of the Drawings]

An approximate line Fig. for the flow chart showing channel selection actuation of the subchannel of one example of the television receiver according [ Fig. 1 ] to this invention and Fig. 2 to explain channel selection actuation of the subchannel of one example of this invention, the block diagram showing [ 3 ] the configuration of the one whole example of this invention, and Figs. 4 and 5 are the flow charts and approximate line Figs. for explaining playback actuation of the Lord and the subimage of one example of this invention.

(5M) -- for the main image and a chrominance-signal circuit, and (8S), as for a video-signal processing circuit and (20), a subimage and a chrominance-signal circuit, and (12) are [ the main tuner and (5S) / a subtuner and (8M) / a system control circuit and (24) ] remote controllers.

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(54) 【発明の名称】 テレビジョン受像機

(57) 【特許請求の範囲】

【請求項1】主副チューナからの主副チャンネル信号及び外部入力信号が入力される切換手段と、前記切換手段を介して主チャンネル信号又は外部入力信号の何れかを主画面に表示すると共に、前記切換手段を介して出力される副チャンネル信号又は外部入力信号の何れかを副画面に表示する表示手段と、少なくとも前記副チューナのラストチャンネルを記憶する記憶手段と、前記副チューナのチャンネルのアップ又はダウンを指示するための操作手段と、前記副画面に前記外部入力信号の画像が表示される第1の状態であって、かつ前記操作手段によって副チャンネルのアップ又はダウンが指示された場合に、前記副画面に前記副チューナからの副チャンネル信号の副画像が表

示される第2の状態とすべく前記切換手段を制御すると共に、前記副チューナが前記記憶手段に記憶されたラストチャンネルの副画像を受信すべく前記副チューナを制御するシステム制御手段とを具備することを特徴とするテレビジョン受像機。

【発明の詳細な説明】

以下の順序で本発明を説明する。

- A 産業上の利用分野
- B 発明の概要
- C 従来の技術
- D 発明が解決しようとする問題点
- E 問題点を解決するための手段(第1図)
- F 作用
- G 実施例
- G1 全体の構成(第3図)

## G2 主・副画像の再生 (第4図, 第5図)

## G3 副チャンネルの選局 (第1図, 第2図)

## H 発明の効果

## A 産業上の利用分野

本発明は、主画面内に副画面を表示させるようにした、テレビジョン受像機に関する。

## B 発明の概要

本発明は、主画面内副画面表示形のテレビジョン受像機において、副画面内での外部入力画像の再生時に、副チャンネル選局手段が操作された場合、副チャンネル画像を再生するようになることにより、副画像用の映像信号源切換手段を省略して、使用者の混乱を防止したものである。

## C 従来の技術

従来、主画面内に副画面を表示させるようにした、所謂ピクチャー・イン・ピクチャー形のテレビジョン受像機 (以下P/P受像機と略称する) が知られている。

後述するように、P/P受像機は副画面に画像を再生するためのメモリを備えており、このメモリの書き込み、読み出しを連続して交互に繰返すことによって、副画面に動画を再生することができる。

そして、従来のP/P受像機では、主画面に再生される画像 (主画像) 及び副画面に再生される画像 (副画像) の各信号源として、放送やCATVのような高周波信号と、VTRやビデオディスクのようなベースバンドの外部映像信号とが対象とされていた。

## D 発明が解決しようとする問題点

ところで、テレビジョン放送は、例えば、或放送局の野球の番組と、他の放送局のゴルフの番組とのように、視聴者が興味を湧いている2つの番組が同時に放送される場合がある。

このような場合、従来のP/P受像機では、主及び副の2画面の再生機能を活用することができず、2系統の高周波受信が可能なP/P受像機が要望されていた。

ところが、2つのチューナを設けた場合、選局操作機構として、0から9までの数字のキー (テンキー)、チャンネル番号のアップ及びダウンのキーを各チューナ毎に設けると、キーの数が多過ぎて、使用者の誤操作等による無用の混乱を招くという問題があった。

加えて、受像機乃至はリモート制御器では、各種の制御用の操作キーの取付け可能面積が制限されるため、操作キーの数を増やすことは困難であるという問題があった。

また、P/P受像機では、テレビジョン放送受信状態 (TVモード) と、外部映像信号再生状態 (ビデオモード) との切換が必要であるが、このモード切換とチューナの選局とを関連させると、回路構成が複雑になるため、モード切換と選局とは互いに独立して行なわれる。

ところが、2つのチューナに対して、それぞれモード切換キー及び選局操作機構を設けると、更にキー数が増

加して、上述の問題点が助長されてしまう。

かゝる点に鑑み、本発明の目的は、操作部が簡単化され、使用者の混乱を招かない、主画面内副画面表示形のテレビジョン受像機を提供するところにある。

## E 問題点を解決するための手段

本発明は主副チューナ (5M) (5S) からの主副チャンネル信号及び外部入力信号が入力される切換手段 (7M) (7S) と、この切換手段 (7M) (7S) を介して出力される主チャンネル信号又は外部入力信号の何れかを主画面Smに表示すると共に、切換手段 (7M) (7S) を介して出力される副チャンネル信号又は外部入力信号の何れかを副画面Ssに表示する表示手段 (18) と、少なくとも副チューナのラストチャンネルを記憶する記憶手段 (21) と、副チューナのチャンネルのアップ又はダウンを指示するための操作手段 (22) (24) と、副画面に外部入力信号の画像が表示される第1の状態であって、かつ前記操作手段 (22) (24) によって副チャンネルのアップ又はダウンが指示された場合に、副画面に副チューナ (5S) からの副チャンネル信号の副画像が表示される第2の状態とすべく切換手段 (7M) (7S) を制御すると共に、副チューナ (5S) が記憶手段 (21) に記憶されたラストチャンネルの副画像を受信すべく副チューナ (5S) を制御するシステム制御手段 (20) とを具備することを特徴とするテレビジョン受像機である。

## F 作用

かゝる本発明によれば、副画像の動作モードを切り換えるための制御操作手段を特に設けずとも、副画像の動作モード切換えが混乱なく確實に行なわれる。

## G 実施例

以下、第1図～第5図を参照しながら、本発明によるテレビジョン受像機の一実施例について説明する。

## G1 全体の構成

まず、第3図を参照して、一実施例のテレビジョン受像機の全体の構成を説明する。このテレビジョン受像機は、主テレビジョン回路MK及び副テレビジョン回路SKを有し、主テレビジョン回路MKよりの映像信号に基づいて、陰極線管 (18) の管面全体に主画面を映出し、副テレビジョン回路SKよりの映像信号に基づいて、副画面を主画面の一部にはめ込むように管面に映出する。これらテレビジョン回路MK, SKは、夫々チューナ (5M), (5S)、映像中間周波回路 (6M), (6S) 及び映像・色信号回路 (8M), (8S) を備えている。

又、VTR等よりの再生映像信号 (ベースバンド信号) の供給される外部映像信号入力端子V1, V2, V3を有し、これら入力端子よりの外部映像信号が、テレビジョン回路MK, SKに夫々設けられたスイッチ回路 (7M), (7S) によって、チューナ (5M), (5S) からの映像信号と切り換えられて、陰極線管 (18) に供給されてその映像が映出され得るようになされている。

副テレビジョン回路SKには、副画面を陰極線管 (18)

に映出するための映像信号処理回路(12)が設けられており、これにより副画面の動画、静止画、胸撮画等の別、副画面の個数、副画面の主画面上の位置等を制御するようにしている。

テレビジョン回路MK,SKには、夫々文字表示回路(19M), (19S)が設けられており、主画面及び副画面に各別に、テレビジョン放送の受信チャンネル及び外部映像信号入力端子の番号等の映像識別表示を $\square$ して映出するようになされている。

マイクロコンピュータを備えるシステム制御回路(20)が設けられ、これによってテレビジョン受像機の各部を制御するようになされている。

次に、このテレビジョン受像機の構成を更に詳細に説明する。アンテナATよりの受信信号は分岐器(1)に供給される。この分岐器(1)は受信信号を殆ど減衰することなくスイッチ回路(3)を遍じて主チューナ(5M)に供給し、その一部を副チューナ(5S)に分岐して供給する。この副チューナ(5S)への受信信号は高周波増幅器(4)によって増幅される。スイッチ回路(3)は、分岐器(1)よりのアンテナ入力と、補助入力端子(2)よりの、ケーブルテレビジョン放送受信用デスクランブラ等よりの高周波入力を切り換えて、主チューナ(5M)に供給する。

主チューナ(5M)よりの映像中間周波信号は主映像中間周波回路(6M)に供給され、これよりの映像信号が主スイッチ回路(7M)に供給されて、外部映像信号入力端子 $V_1 \sim V_3$ からの外部映像信号と切り換えられ、その内の一つの映像信号が主映像・色信号回路(8M)に供給される。尚、(26)はモニタ出力端子で、主スイッチ回路(7M)の出力側に接続されている。この主映像・色信号回路(8M)からは赤、緑及び青色信号R, G, Bが出力されて、スイッチ回路(9)に供給される。

主映像中間周波回路(6M)よりの音声中間周波信号は音声回路(音声多重回路を内蔵している)(28)に供給され、その音声回路(28)よりの音声信号がスイッチ回路(29)に供給されて、上述の外部映像信号入力端子 $V_1 \sim V_3$ に対応する、外部音声信号入力端子 $A_1, A_2, A_3$ よりのVTR等より再生された外部音声信号と切り換えられ、その内の一つの音声信号が低周波増幅器(30)を介して、スピーカ(31)に供給される。

主映像・色信号回路(8M)よりの水平及垂直同期信号が偏向・高圧回路(27)に供給され、これよりの偏向信号及び高圧直流電圧が陰極線管(18)に供給される。

副チューナ(5S)よりの映像中間周波信号は副映像中間周波回路(6S)に供給され、これよりの映像信号が副スイッチ回路(7S)に供給されて、外部映像信号入力端子 $V_1 \sim V_3$ からの外部映像信号と切り換えられ、その内の一つの映像信号及び主スイッチ回路(7M)よりの映像信号がスイッチ(25)により切り換えられた後、副映像・色信号回路(8S)に供給される。この副映像・色信号回

路(8S)からは赤、緑及び青色信号R, G, Bが得られ、これらがマトリクス回路(10)に供給されて、輝度、赤色差及び青色差信号Y, R-Y, B-Yに変換された後、映像信号処理回路(12)のA/D変換器(13)に供給される。

このA/D変換器(13)は特公昭60-44792号公報に開示されている如き時分割形A/D変換器である。A/D変換器(13)よりのデジタル信号はメモリ(14)に供給されて $\square$ き込まれる。メモリ(14)より読み出されたデジタル信号はD/A変換器(15)に供給されてアナログ信号に変換される。映像信号処理回路(12)では、映像信号のライン及び画素を主画面及び副画面の寸法比に応じて間引くようにする。メモリ(14)は、副画面の可能最大個数例えば、4に応じて4個のフレーム(又はフィールド)メモリ領域を有している。このメモリ(14)は副画面制御回路(16)によって、副画面の動画、静止画、胸撮画等の別、副画面の個数、副画面の主画面上の位置等が制御される。

副画面を動画にするときは、メモリ(14)の映像信号の $\square$ き込み及び読み出しを、連続して交互に繰り返す。副画面を静止画にするときは、メモリ(14)に映像信号をフレーム又はフィールド単位で $\square$ き込んだ後、これを繰り返し読み出す。副画面の胸撮画のときは、メモリ(14)に異なるタイミングで複数の映像信号をフレーム又はフィールド単位で $\square$ き込んだ後、これを繰り返し読み出す(特開昭56-27573号公報参照)。主画面内にはめ込まれる副画面の個数は夫々メモリ(14)内のメモリ領域の使用個数で決定する。副画面の内容としては、副映像・色信号回路(8S)からの映像信号の動画、静止画、胸撮画、又は主映像・色信号回路(8M)からの映像信号の静止画、胸撮画で、これら映像信号の切り換えは、上述したスイッチ(25)の切り換えによって行う。主画面及び副画面の映像内容は主及び副チューナ(5M), (5S)の受信チャンネルの同時切り換え、又は主及び副スイッチ回路(7M), (7S)の同時切り換えにより入れ替えることができる。

主映像・色信号回路(8M)よりの各色信号と映像信号処理回路(12)のD/A変換器(15)よりの各色信号とはスイッチ回路(9)に供給されて、主画面の一部の選択された所定位 $\square$ に副画面がはめ込まれるように、両各色信号が切り換えられる。このスイッチ回路(9)は副画面制御回路(16)によって制御される。スイッチ回路(9)よりの映像信号は陰極線管(18)に供給される。

主文字表示回路(19M)で作られた主映像識別表示信号は、スイッチ回路(9)及び陰極線管(18)間に設けられた加算器(17)によって映像信号に加算される。ここでは、加算器(17)を例えば、緑色信号の伝送路のみに介して、主画面に緑の映像識別表示を $\square$ するようにしている。この映像識別表示は他の色でも良い。

副文字表示回路(19S)で作られた副映像識別表示信号は、マトリクス回路(10)及びA/D変換器(13)間に